Use volume snapshots for data protection

Element Software

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Table of Contents

Use volume snapshots for data protection . . . 1
Find more information . . . 1
Use individual volume snapshots for data protection . . . 1
Using group snapshots for data protection task . . . 6
Schedule a snapshot . . . 10

Use volume snapshots for data protection

A volume snapshot is a point-in-time copy of a volume. You can take a snapshot of a volume and use the snapshot later if you need to roll a volume back to the state it was in at the time the snapshot was created.

Snapshots are similar to volume clones. However, snapshots are simply replicas of volume metadata, so you cannot mount or write to them. Creating a volume snapshot also takes only a small amount of system resources and space, which makes snapshot creation faster than cloning.

You can take a snapshot of an individual volume or a set of volumes.

Optionally, replicate snapshots to a remote cluster and use them as a backup copy of the volume. This enables you to roll back a volume to a specific point in time by using the replicated snapshot. Alternatively, you can create a clone of a volume from a replicated snapshot.

Find more information

- Use individual volume snapshots for data protection
- Using group snapshots for data protection task
- Scheduling a snapshot

Use individual volume snapshots for data protection

A volume snapshot is a point-in-time copy of a volume. You can use an individual volume rather than a group of volumes for the snapshot.

Find more information

- Create a volume snapshot
- Edit snapshot retention
- Deleting a snapshot
- Cloning a volume from a snapshot
- Rolling back a volume to a snapshot
- Backing up a volume snapshot to an Amazon S3 object store
- Backing up a volume snapshot to an OpenStack Swift object store
- Backing up a volume snapshot to a SolidFire cluster

Create a volume snapshot

You can create a snapshot of an active volume to preserve the volume image at any point in time. You can create up to 32 snapshots for a single volume.

1. Click **Management** > **Volumes**.
2. Click the **Actions** icon for the volume you want to use for the snapshot.

3. In the resulting menu, select **Snapshot**.
4. In the **Create Snapshot of Volume** dialog box, enter the new snapshot name.
5. **Optional:** Select the **Include Snapshot in Replication When Paired** check box to ensure that the snapshot is captured in replication when the parent volume is paired.
6. To set the retention for the snapshot, select from one of the following options:
   - Click **Keep Forever** to retain the snapshot on the system indefinitely.
   - Click **Set Retention Period** and use the date spin boxes to choose a length of time for the system to retain the snapshot.
7. To take a single, immediate snapshot, perform the following steps:
   a. Click **Take Snapshot Now**.
   b. Click**Create Snapshot**.
8. To schedule the snapshot to run at a future time, perform the following steps:
   a. Click **Create Snapshot Schedule**.
   b. Enter a **New Schedule Name**.
   c. Choose a **Schedule Type** from the list.
   d. **Optional:** Select the **Recurring Schedule** check box to repeat the scheduled snapshot periodically.
   e. Click **Create Schedule**.

Find more information

Schedule a snapshot

Edit snapshot retention

You can change the retention period for a snapshot to control when or if the system deletes snapshots. The retention period you specify begins when you enter the new interval. When you set a retention period, you can select a period that begins at the current time (retention is not calculated from the snapshot creation time). You can specify intervals in minutes, hours, and days.

Steps

1. Click **Data Protection** > **Snapshots**.
2. Click the **Actions** icon for the snapshot you want to edit.
3. In the resulting menu, click **Edit**.
4. **Optional:** Select the**Include Snapshot in Replication When Paired** check box to ensure that the snapshot is captured in replication when the parent volume is paired.
5. **Optional:** Select a retention option for the snapshot:
   - Click **Keep Forever** to retain the snapshot on the system indefinitely.
   - Click **Set Retention Period** and use the date spin boxes to select a length of time for the system to retain the snapshot.
6. Click **Save Changes**.

Delete a snapshot

You can delete a volume snapshot from a storage cluster running Element software. When you delete a snapshot, the system immediately removes it.

You can delete snapshots that are being replicated from the source cluster. If a snapshot is syncing to the target cluster when you delete it, the sync replication completes and the snapshot is deleted from the source cluster. The snapshot is not deleted from the target cluster.

You can also delete snapshots that have been replicated to the target from the target cluster. The deleted snapshot is kept in a list of deleted snapshots on the target until the system detects that you have deleted the snapshot on the source cluster. When the target detects that you have deleted the source snapshot, the target stops replication of the snapshot.

When you delete a snapshot from the source cluster, the target cluster snapshot is not affected (the reverse is also true).

1. Click **Data Protection** > **Snapshots**.
2. Click the **Actions** icon for the snapshot you want to delete.
3. In the resulting menu, select **Delete**.
4. Confirm the action.

Clone a volume from a snapshot

You can create a new volume from a snapshot of a volume. When you do this, the system uses the snapshot information to clone a new volume using the data contained on the volume at the time the snapshot was created. This process stores information about other snapshots of the volume in the newly created volume.

1. Click **Data Protection** > **Snapshots**.
2. Click the **Actions** icon for the snapshot you want to use for the volume clone.
3. In the resulting menu, click **Clone Volume From Snapshot**.
4. Enter a **Volume Name** in the **Clone Volume From Snapshot** dialog box.
5. Select a **Total Size** and size units for the new volume.
6. Select an **Access** type for the volume.
7. Select an **Account** from the list to associate with the new volume.
8. Click **Start Cloning**.

Roll back a volume to a snapshot

You can roll back a volume to a previous snapshot at any time. This reverts any changes made to the volume since the snapshot was created.

Steps

1. Click **Data Protection** > **Snapshots**.
2. Click the **Actions** icon for the snapshot you want to use for the volume rollback.

3. In the resulting menu, select **Rollback Volume To Snapshot**.
4. **Optional:** To save the current state of the volume before rolling back to the snapshot:
   a. In the **Rollback To Snapshot** dialog box, select **Save volume's current state as a snapshot**.
   b. Enter a name for the new snapshot.
5. Click **Rollback Snapshot**.

Back up a volume snapshot

You can use the integrated backup feature to back up a volume snapshot. You can back up snapshots from a SolidFire cluster to an external object store, or to another SolidFire cluster. When you back up a snapshot to an external object store, you must have a connection to the object store that allows read/write operations.

- Back up a volume snapshot to an Amazon S3 object store
- Back up a volume snapshot to an OpenStack Swift object store
- Back up a volume snapshot to a SolidFire cluster

Back up a volume snapshot to an Amazon S3 object store

You can back up SolidFire snapshots to external object stores that are compatible with Amazon S3.

1. Click**Data Protection** > **Snapshots**.
2. Click the **Actions** icon for the snapshot you want to back up.
3. In the resulting menu, click **Backup to**.
4. In the **Integrated Backup** dialog box under **Backup to**, select **S3**.
5. Select an option under **Data Format**:
   - **Native**: A compressed format readable only by SolidFire storage systems.
   - **Uncompressed**: An uncompressed format compatible with other systems.
6. Enter a hostname to use to access the object store in the **Hostname** field.
7. Enter an access key ID for the account in the **Access Key ID** field.
8. Enter the secret access key for the account in the **Secret Access Key** field.
9. Enter the S3 bucket in which to store the backup in the **S3 Bucket** field.
10. **Optional**: Enter a nametag to append to the prefix in the **Nametag** field.
11. Click **Start Read**.

Back up a volume snapshot to an OpenStack Swift object store

You can back up SolidFire snapshots to secondary object stores that are compatible with OpenStack Swift.

1. Click **Data Protection** > **Snapshots**.
2. Click the **Actions** icon for the snapshot you want to back up.

3. In the resulting menu, click **Backup to**.
4. In the **Integrated Backup** dialog box, under **Backup to**, select **Swift**.
5. Select an option under **Data Format**:
   - **Native**: A compressed format readable only by SolidFire storage systems.
   - **Uncompressed**: An uncompressed format compatible with other systems.
6. Enter a **URL** to use to access the object store.
7. Enter a **Username** for the account.
8. Enter the **Authentication Key** for the account.
9. Enter the **Container** in which to store the backup.
10. **Optional**: Enter a **Nametag**.
11. Click **Start Read**.

Back up a volume snapshot to a SolidFire cluster

You can back up volume snapshots residing on a SolidFire cluster to a remote SolidFire cluster.

Ensure that the source and target clusters are paired.

When backing up or restoring from one cluster to another, the system generates a key to be used as authentication between the clusters. This bulk volume write key allows the source cluster to authenticate with the destination cluster, providing a level of security when writing to the destination volume. As part of the backup or restore process, you need to generate a bulk volume write key from the destination volume before starting the operation.

1. On the destination cluster, click **Management** > **Volumes**.
2. Click the **Actions** icon for the destination volume.
3. In the resulting menu, click **Restore from**.
4. In the **Integrated Restore** dialog box under **Restore from**, select **SolidFire**.
5. Select a data format under **Data Format**:
   - **Native**: A compressed format readable only by SolidFire storage systems.
   - **Uncompressed**: An uncompressed format compatible with other systems.
6. Click **Generate Key**.
7. Copy the key from the **Bulk Volume Write Key** box to your clipboard.
8. On the source cluster, click **Data Protection** > **Snapshots**.
9. Click the Actions icon for the snapshot you want to use for the backup.
10. In the resulting menu, click **Backup to**.
11. In the**Integrated Backup** dialog box under **Backup to**, select **SolidFire**.
12. Select the same data format you selected earlier in the **Data Format** field.
13. Enter the management virtual IP address of the destination volume's cluster in the **Remote Cluster MVIP** field.
14. Enter the remote cluster user name in the **Remote Cluster Username** field.

15. Enter the remote cluster password in the **Remote Cluster Password** field.
16. In the **Bulk Volume Write Key** field, paste the key you generated on the destination cluster earlier.
17. Click **Start Read**.

Using group snapshots for data protection task

You can create a group snapshot of a related set of volumes to preserve a point-in-time copy of the metadata for each volume. You can use the group snapshot in the future as a backup or rollback to restore the state of the group of volumes to a previous state.

Find more information

- Create a group snapshot
- Edit group snapshots
- Edit members of group snapshot
- Delete a group snapshot
- Roll back volumes to a group snapshot
- Clone multiple volumes
- Clone multiple volumes from a group snapshot

Group snapshot details

The Group Snapshots page on the Data Protection tab provides information about the group snapshots.

- **ID**

  The system-generated ID for the group snapshot.

- **UUID**

  The unique ID of the group snapshot.

- **Name**

  User-defined name for the group snapshot.

- **Create Time**

  The time at which the group snapshot was created.

- **Status**

  The current status of the snapshot. Possible values:

  - Preparing: The snapshot is being prepared for use and is not yet writable.
  - Done: This snapshot has finished preparation and is now usable.
  - Active: The snapshot is the active branch.

- **# Volumes**

  The number of volumes in the group.

- **Retain Until**

  The day and time the snapshot will be deleted.

- **Remote Replication**

  Indication of whether or not the snapshot is enabled for replication to a remote SolidFire cluster. Possible values:

  - Enabled: The snapshot is enabled for remote replication.
  - Disabled: The snapshot is not enabled for remote replication.

Creating a group snapshot

You can create a snapshot of a group of volumes, and you can also create a group snapshot schedule to automate group snapshots. A single group snapshot can consistently snapshot up to 32 volumes at one time.

Steps

1. Click **Management** > **Volumes**.
2. Use the check boxes to select multiple volumes for a group of volumes.
3. Click **Bulk Actions**.
4. Click **Group Snapshot**.
5. Enter a new group snapshot name in the Create Group Snapshot of Volumes dialog box.
6. **Optional:** Select the **Include Each Group Snapshot Member in Replication When Paired** check box to ensure that each snapshot is captured in replication when the parent volume is paired.
7. Select a retention option for the group snapshot:
   - Click **Keep Forever** to retain the snapshot on the system indefinitely.
   - Click **Set Retention Period** and use the date spin boxes to choose a length of time for the system to retain the snapshot.
8. To take a single, immediate snapshot, perform the following steps:
   a. Click **Take Group Snapshot Now**.
   b. Click **Create Group Snapshot**.
9. To schedule the snapshot to run at a future time, perform the following steps:
   a. Click **Create Group Snapshot Schedule**.
   b. Enter a **New Schedule Name**.
   c. Select a **Schedule Type** from the list.
   d. **Optional:** Select the **Recurring Schedule** check box to repeat the scheduled snapshot periodically.
   e. Click **Create Schedule**.

Editing group snapshots

You can edit the replication and retention settings for existing group snapshots.

1. Click **Data Protection** > **Group Snapshots**.
2. Click the Actions icon for the group snapshot you want to edit.
3. In the resulting menu, select **Edit**.
4. **Optional:** To change the replication setting for the group snapshot:
   a. Click **Edit** next to **Current Replication**.
   b. Select the **Include Each Group Snapshot Member in Replication When Paired** check box to ensure that each snapshot is captured in replication when the parent volume is paired.
5. **Optional:** To change the retention setting for the group snapshot, select from the following options:
   a. Click **Edit** next to **Current Retention**.
   b. Select a retention option for the group snapshot:
      - Click **Keep Forever** to retain the snapshot on the system indefinitely.
      - Click **Set Retention Period** and use the date spin boxes to choose a length of time for the system to retain the snapshot.
6. Click **Save Changes**.

Deleting a group snapshot

You can delete a group snapshot from the system. When you delete the group snapshot, you can choose whether all snapshots associated with the group are deleted or retained as individual snapshots.

If you delete a volume or snapshot that is a member of a group snapshot, you can no longer roll back to the group snapshot. However, you can roll back each volume individually.

1. Click **Data Protection** > **Group Snapshots**.
2. Click the Actions icon for the snapshot you want to delete.
3. In the resulting menu, click **Delete**.
4. Select from one of the following options in the confirmation dialog box:
   - Click **Delete group snapshot AND all group snapshot members** to delete the group snapshot and all member snapshots.
   - Click **Retain group snapshot members as individual snapshots** to delete the group snapshot but keep all member snapshots.
5. Confirm the action.

Roll back volumes to a group snapshot

You can roll back a group of volumes at any time to a group snapshot.

When you roll back a group of volumes, all volumes in the group are restored to the state they were in at the time the group snapshot was created. Rolling back also restores volume sizes to the size recorded in the original snapshot. If the system has purged a volume, all snapshots of that volume were also deleted at the

time of the purge; the system does not restore any deleted volume snapshots.

1. Click **Data Protection** > **Group Snapshots**.
2. Click the Actions icon for the group snapshot you want to use for the volume rollback.
3. In the resulting menu, select **Rollback Volumes To Group Snapshot**.
4. **Optional**: To save the current state of the volumes before rolling back to the snapshot:
   a. In the **Rollback To Snapshot** dialog box, select **Save volumes' current state as a group snapshot**.
   b. Enter a name for the new snapshot.
5. Click **Rollback Group Snapshot**.

Editing members of group snapshot

You can edit the retention settings for members of an existing group snapshot.

1. Click **Data Protection** > **Snapshots**.
2. Click the **Members** tab.
3. Click the Actions icon for the group snapshot member you want to edit.
4. In the resulting menu, select **Edit**.
5. To change the replication setting for the snapshot, select from the following options:
   - Click **Keep Forever** to retain the snapshot on the system indefinitely.
   - Click **Set Retention Period** and use the date spin boxes to choose a length of time for the system to retain the snapshot.
6. Click **Save Changes**.

Clone multiple volumes

You can create multiple volume clones in a single operation to create a point-in-time copy of the data on a group of volumes.

When you clone a volume, the system creates a snapshot of the volume and then creates a new volume from the data in the snapshot. You can mount and write to the new volume clone. Cloning multiple volumes is an asynchronous process and takes a variable amount of time depending on the size and number of the volumes being cloned.

Volume size and current cluster load affect the time needed to complete a cloning operation.

Steps

1. Click **Management** > **Volumes**.
2. Click the **Active** tab.
3. Use the check boxes to select multiple volumes, creating a group of volumes.
4. Click **Bulk Actions**.
5. Click **Clone** in the resulting menu.
6. Enter a **New Volume Name Prefix** in the **Clone Multiple Volumes** dialog box.

   The prefix is applied to all volumes in the group.

7. **Optional:** Select a different account to which the clone will belong.

   If you do not select an account, the system assigns the new volumes to the current volume account.

8. **Optional:** Select a different access method for the volumes in the clone.

   If you do not select an access method, the system uses the current volume access.

9. Click **Start Cloning**.

Cloning multiple volumes from a group snapshot

You can clone a group of volumes from a point-in-time group snapshot. This operation requires that a group snapshot of the volumes already exist, because the group snapshot is used as the basis to create the volumes. After you create the volumes, you can use them like any other volume in the system.

Volume size and current cluster load affect the time needed to complete a cloning operation.

1. Click **Data Protection** > **Group Snapshots**.
2. Click the Actions icon for the group snapshot you want to use for the volume clones.
3. In the resulting menu, select **Clone Volumes From Group Snapshot**.
4. Enter a **New Volume Name Prefix** in the **Clone Volumes From Group Snapshot** dialog box.

   The prefix is applied to all volumes created from the group snapshot.

5. **Optional:** Select a different account to which the clone will belong.

   If you do not select an account, the system assigns the new volumes to the current volume account.

6. **Optional:** Select a different access method for the volumes in the clone.

   If you do not select an access method, the system uses the current volume access.

7. Click **Start Cloning**.

Schedule a snapshot

You can protect data on a volume or a group of volumes by scheduling volume snapshots to occur at specified intervals. You can schedule either single volume snapshots or group snapshots to run automatically.

When you configure a snapshot schedule, you can choose from time intervals based on days of the week or days of the month. You can also specify the days, hours, and minutes before the next snapshot occurs. You can store the resulting snapshots on a remote storage system if the volume is being replicated.

Find more information

- Create a snapshot schedule
- Edit a snapshot schedule

- Delete a snapshot schedule
- Copy a snapshot schedule

Snapshot schedule details

On the Data Protection > Schedules page, you can view the following information in the list of snapshot schedules.

- **ID**

  The system-generated ID for the snapshot.

- **Type**

  The type of schedule. Snapshot is currently the only type supported.

- **Name**

  The name given to the schedule when it was created. Snapshot schedule names can be up to 223 characters in length and contain a-z, 0-9, and dash (-) characters.

- **Frequency**

  The frequency at which the schedule is run. The frequency can be set in hours and minutes, weeks, or months.

- **Recurring**

  Indication of whether the schedule is to run only once or at regular intervals.

- **Manually Paused**

  Indication of whether or not the schedule has been manually paused.

- **Volume IDs**

  The ID of the volume the schedule will use when the schedule is run.

- **Last Run**

  The last time the schedule was run.

- **Last Run Status**

  The outcome of the last schedule execution. Possible values:

  - Success
  - Failure

Create a snapshot schedule

You can schedule a snapshot of a volume or volumes to automatically occur at specified intervals.

When you configure a snapshot schedule, you can choose from time intervals based on days of the week or days of the month. You can also create a recurring schedule and specify the days, hours, and minutes before the next snapshot occurs.

If you schedule a snapshot to run at a time period that is not divisible by 5 minutes, the snapshot will run at the next time period that is divisible by 5 minutes. For example, if you schedule a snapshot to run at 12:42:00 UTC, it will run at 12:45:00 UTC. You cannot schedule a snapshot to run at intervals of less than 5 minutes.

Steps

1. Click **Data Protection** > **Schedules**.
2. Click **Create Schedule**.
3. In the **Volume IDs CSV** field, enter a single volume ID or a comma-separated list of volume IDs to include in the snapshot operation.
4. Enter a new schedule name.
5. Select a schedule type and set the schedule from the options provided.
6. **Optional:** Select **Recurring Schedule** to repeat the snapshot schedule indefinitely.
7. **Optional:** Enter a name for the new snapshot in the **New Snapshot Name** field.

   If you leave the field blank, the system uses the time and date of the snapshot's creation as the name.
8. **Optional:** Select the **Include Snapshots in Replication When Paired** check box to ensure that the snapshots are captured in replication when the parent volume is paired.
9. To set the retention for the snapshot, select from the following options:
   - Click **Keep Forever** to retain the snapshot on the system indefinitely.
   - Click **Set Retention Period** and use the date spin boxes to choose a length of time for the system to retain the snapshot.
10. Click **Create Schedule**.

Edit a snapshot schedule

You can modify existing snapshot schedules. After modification, the next time the schedule runs it uses the updated attributes. Any snapshots created by the original schedule remain on the storage system.

Steps

1. Click **Data Protection** > **Schedules**.
2. Click the **Actions** icon for the schedule you want to change.
3. In the resulting menu, click **Edit**.
4. In the **Volume IDs CSV** field, modify the single volume ID or comma-separated list of volume IDs currently included in the snapshot operation.
5. To pause or resume the schedule, select from the following options:
   - To pause an active schedule, select **Yes** from the **Manually Pause Schedule** list.
   - To resume a paused schedule, select **No** from the **Manually Pause Schedule** list.
6. Enter a different name for the schedule in the **New Schedule Name** field if desired.
7. To change the schedule to run on different days of the week or month, select **Schedule Type** and change

the schedule from the options provided.

8. **Optional:** Select **Recurring Schedule** to repeat the snapshot schedule indefinitely.
9. **Optional:** Enter or modify the name for the new snapshot in the **New Snapshot Name** field.

   If you leave the field blank, the system uses the time and date of the snapshot's creation as the name.

10. **Optional:** Select the **Include Snapshots in Replication When Paired** check box to ensure that the snapshots are captured in replication when the parent volume is paired.
11. To change the retention setting, select from the following options:
    - Click **Keep Forever** to retain the snapshot on the system indefinitely.
    - Click **Set Retention Period** and use the date spin boxes to select a length of time for the system to retain the snapshot.
12. Click **Save Changes**.

Copy a snapshot schedule

You can copy a schedule and maintain its current attributes.

1. Click **Data Protection** > **Schedules**.
2. Click the Actions icon for the schedule you want to copy.
3. In the resulting menu, click **Make a Copy**.

   The **Create Schedule** dialog box appears, populated with the current attributes of the schedule.

4. **Optional:** Enter a name and updated attributes for the new schedule.
5. Click **Create Schedule**.

Delete a snapshot schedule

You can delete a snapshot schedule. After you delete the schedule, it does not run any future scheduled snapshots. Any snapshots that were created by the schedule remain on the storage system.

1. Click **Data Protection** > **Schedules**.
2. Click the **Actions** icon for the schedule you want to delete.
3. In the resulting menu, click **Delete**.
4. Confirm the action.

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